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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,162	12/08/2003	Yushi Ono	4444-032065	2307

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THE WEBB LAW FIRM, P.C.
700 KOPPERS BUILDING
436 SEVENTH AVENUE
PITTSBURGH, PA 15219

EXAMINER	
LUKS, JEREMY AUSTIN	
ART UNIT	**PAPER NUMBER**
2837	

DATE MAILED: 11/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/730,162	ONO ET AL.	
	Examiner	Art Unit	
	Jeremy Luks	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Okuzawa (JP 01067099 A). Okuzawa teaches a loudspeaker diaphragm (Figure 1, #8) comprising a base layer having a woven fabric of a polyethylene naphthalate fiber impregnated with a thermosetting resin (See translated abstract).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okuzawa (JP 01067099 A) in view of Ward (4,076,098) and Kanada (US 2002/0045040). Okuzawa further teaches a loudspeaker diaphragm comprising a base layer of a polyethylene naphthalate fiber impregnated with a thermosetting resin (See translated abstract). Okuzawa fails to teach a base layer having a woven fabric. Ward

discloses a base layer (Figure 1, #11) having a fiber impregnated woven fabric (Col. 1, Lines 43-53). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Okuzawa, with the apparatus of Ward to stiffen and dampen the diaphragm. Ward fails to teach a thermoplastic layer. Kanada teaches a thermoplastic elastomer layer (Page 2, [0014]). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Okuzawa as modified, with the apparatus of Kanada in order to provide a laminate that is thin and has excellent flexibility, while maintaining a high level of soundproofing characteristics.

3. Claims 1, 2, 4, 6-8 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okuzawa (JP 01067099 A) in view of Ward (4,076,098) and Watanabe (US 2002/0027997). Okuzawa is relied upon for the reasons and disclosures set forth above. Okuzawa further teaches a loudspeaker diaphragm comprising a base layer of a polyethylene naphthalate fiber impregnated with a thermosetting resin (See translated abstract). Okuzawa fails to teach a base layer having a woven fabric of a fiber impregnated with a thermosetting melanine resin, whereby the fiber is coated with a second thermosetting resin, and a fiber/resin ratio in the base layer is in the range of 60/40 to 80/20 by weight; and a vinyl resin based thermoplastic resin layer, Ward discloses a base layer (Figure 1, #11) having a woven fabric of a fiber impregnated with a thermosetting melanine resin (Col. 1, Lines 51-53), whereby the fiber is coated with a second thermosetting resin (Col. 2, Lines 56-58). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of

Okuzawa, with the apparatus of Ward to stiffen and dampen the diaphragm. Ward fails to teach a fiber/resin ratio in the base layer is in the range of 60/40 to 80/20 by weight; and a vinyl resin based thermoplastic resin layer. Watanabe discloses a fiber/resin ratio in the base layer is in the range of 60/40 to 80/20 by weight (Page 6, [0075], [0077]); and a vinyl resin based thermoplastic resin layer (Col. 2, Lines 5-10). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Okuzawa as modified, with the apparatus of Watanabe because of the sound absorbing efficiency and availability in the market place of the materials.

4. Claims 9-12, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okuzawa (JP 01067099 A), Ward (4,076,098) and Watanabe (US 2002/0027997), as applied to claims 1 and 7 above, and further in view of Kanada (US 2002/0045040). Okuzawa, Ward and Watanabe are relied upon for the reasons and disclosures set forth above. Ward further discloses curing the thermosetting resin, so as to form a base layer (Col. 2, Lines 33-38). Watanabe further discloses laminating multiple layers (Page 8, [0093]). Okuzawa, Ward and Watanabe fail to disclose adding the inactive gas, carbon dioxide, in a supercritical state to a molten thermoplastic resin and extruding the mixture of the thermoplastic resin and the inactive gas at prescribed temperature and pressure, so as to form a thermoplastic resin layer; and laminating the base layer and the thermoplastic resin layer; a thermoplastic elastomer layer containing at least one selected from the group consisting of a polyester elastomer, a polyurethane elastomer and a polyolefin elastomer; and a foamed structure, wherein an average diameter of a cell in the foamed structure is 10 to 60 μm. Kanada discloses adding the inactive gas, carbon dioxide, in a supercritical state to a molten thermoplastic resin and

extruding the mixture of the thermoplastic resin and the inactive gas at prescribed temperature and pressure, so as to form a thermoplastic resin layer; and laminating the base layer and the thermoplastic resin layer (Page 2, [0018]); a thermoplastic elastomer layer containing at least one selected from the group consisting of a polyester elastomer, a polyurethane elastomer and a polyolefin elastomer (Page 2, [0014]); and a foamed structure (Page 3, [0021]), wherein an average diameter of a cell in the foamed structure is 10 to 60 μm (Page 3, [0026]). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Ward as modified, with the apparatus of Kanada in order to provide a laminate that is thin and has excellent flexibility, while maintaining a high level of soundproofing characteristics.

5. Claims 3 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okuzawa (JP 01067099 A), Ward (4,076,098) and Kanada (US 2002/0045040) as applied to claims 1 and 17 above, and further in view of Yamaji (5,055,341). Okuzawa, Ward, and Kanada are relied upon for the reasons and disclosures set forth above. Okuzawa, Ward and Kanada fail to disclose the base fiber being a monofilament; a thermoplastic resin layer composed of a film; and the thermoplastic elastomer constituting the thermoplastic elastomer layer having a melting point higher than that of a thermoplastic resin constituting the thermoplastic resin layer. Yamaji discloses base fiber being a monofilament (Col. 2, Lines 46-50); a thermoplastic resin layer as an intermediate layer composed of a film (Col. 5, Lines 57-61); and the thermoplastic elastomer constituting the thermoplastic elastomer layer having a melting point higher than that of a thermoplastic resin constituting the thermoplastic resin layer (Col. 6, Lines 23-35). It would have been obvious to one of ordinary skill in the art at the time of the

invention to combine the apparatus of Okuzawa as modified, with the apparatus of Yamaji because of their lightweight and heat resistant characteristics, as well as high productivity at a low cost.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable Okuzawa (JP 01067099 A) in view of Thomas (EP 0508596 A1). Okuzawa is relied upon for the reasons and disclosures set forth above. Okuzawa fails to disclose a base layer comprising an unwoven fabric of a liquid crystal polymer. Thomas discloses a base layer comprising an unwoven fabric of a liquid crystal polymer (Col.1, Lines 34-42). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Okuzawa as modified, with the apparatus of Thomas because a liquid crystal polymer provides substantially better resistance to moisture and to elevated temperature than traditional materials, as well as its good fatigue resistance to survive the rigors of high output sound reproduction over extended periods of time.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okuzawa (JP 01067099 A), Ward (4,076,098) and Watanabe (US 2002/0027997), as applied to Claim 4 above, and further in view of Inoue (6,378,649) and Ogura (5,744,761). Okuzawa, Ward and Watanabe are relied upon for the reasons and disclosures set forth above. Okuzawa, Ward and Watanabe fail to disclose a thermosetting resin as an unsaturated polyester resin and a second thermosetting resin as an epoxy resin or a melamine resin. Inoue discloses a thermosetting resin as an unsaturated polyester resin (Col. 3, Lines 11-12). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Okuzawa as modified, with the apparatus of Inoue for their high elasticity and large internal loss, while providing

excellent flexibility. Inoue fails to disclose a second thermosetting resin as an epoxy resin or a melamine resin. Ogura disclose a second thermosetting resin as an epoxy resin or a melamine resin (Col. 5, Lines 27-32). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Okuzawa as modified, with the apparatus of Ogura because they are sufficient to impart stiffness on a cloth after cooling to ambient temperatures.

Response to Arguments

8. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Claims 1-20 are directed toward a loudspeaker having a balance between rigidity and internal loss. To achieve this balance, applicant has combined materials and methods well known in the art of general acoustics. Because the prior art of Okuzawa, Ward, Watanabe, Kanada, Yamaji, Thomas, Inoue and Ogura all having teachings with the art of acoustics, there is motivation to combine as cited in the preceding office action. Further, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or

all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Further, In response to applicant's argument that the prior art is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, one of ordinary skill in the art of general acoustics would recognize the obvious combination of the prior art references cited above to achieve desired acoustical and structural characteristics.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy Luks whose telephone number is (571) 272-2707. The examiner can normally be reached on Monday-Thursday 8:30-6:00, and alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lincoln Donovan can be reached on (571) 272-1988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jeremy Luks
Patent Examiner
Art Unit 2837

LINCOLN DONOVAN
SUPERVISORY PATENT EXAMINER